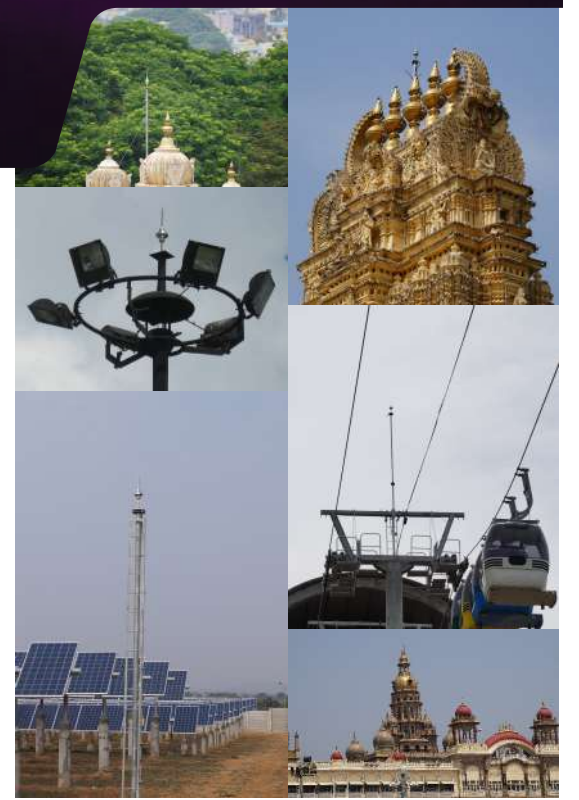


Because so much is precious around us.

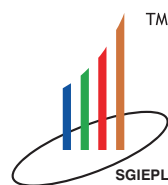


**SGI Engineers**

**A DUTY TO PROTECT**

SGI Engineers Pvt. Ltd. has been at the helm of pushing the boundaries of Earthing and Lightning Protection Technology for over 15 years. Providing the very best in the design of these solutions, the Company is committed to managing all aspects of physical phenomena associated with Lightning and Electrical Energy.

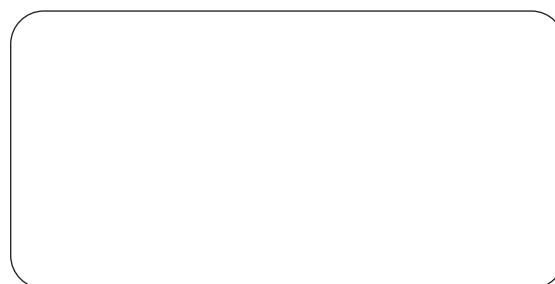
SGI Engineers partners its Customers and Associates in its long term goals to develop and build future viable technologies.



**SGI Engineers Pvt.Ltd.**

#1031/14, 1<sup>st</sup> & 2<sup>nd</sup> Floor, 39<sup>th</sup> Cross, 26<sup>th</sup> Main Road  
 4<sup>th</sup> 'T' Block, Jayanagar, Bengaluru - 560 041, Karnataka, India  
 Tel: +91 80 4121 0467, Fax: +91 080 4157 5792  
 Email : info@sgihouse.in, sgiindia@gmail.com  
 Website : www.sgihouse.in

Associate



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**THE PROTECTION**

India's first indigenous Lightning Conductor adapted to Indian conditions with French Standards.



# Lightning in Thunderstorms are very serious threats to property and life

According to statistics, more than 1900 lightning flashes occur every minute all over the earth's surface. The effect, when lightning strikes is devastating and irreversible! Owners are urged to strongly consider the merits of this brochure for their respective properties as the way to pre-empt 'an act of God'.

## The definition of the Lightning

The vocabulary definition of the lightning is as follows: The electrical discharge that occurs between earth and air is felt by thunder and a strong light. The electric load cells are formed in the clouds. As soon as load cells passes over the low air resistance, the electrical discharge occurs and the loop is completed. Hence lightning is safely earthed.

## The Lightning Protection Methods

As per the statistics, every minute, more than 1,900 lightning flashes fall over the earth's surface. Besides the prevention methods against lightning, there are also methods to safeguard public and industrial places. The external protection systems are used for this purpose and there are 3 major types, as mentioned below:

1. Lightning Conductor Systems (ESE Conductors, Radioactive Conductors etc.)
2. Faraday Cage Systems
3. Franklin Rod Systems

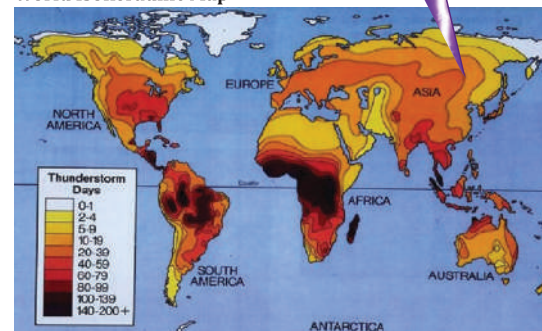


**The Working Principle of Taran, Early Streamer Emission Lightning Conductor**  
Designed as an Active Lightning Conductor, Taran incorporates/emits local electrostatic field that develops naturally around the system as a thunderstorm begins to gather.

When forked lightning descends, high - tension pulses are generated from built-in triggering device at Taran tip. This causes a 'Corona Effect'.

As the downward leader approaches the ground, powerful upward streamers get triggered off, aided by a strong 'Venturi Effect' that is built in the system. The early synchronization between the downward and upward leaders (streamers from Taran) thus, renders the lightning harmless. Taran meets triggering advance time ( $\Delta t$ ) as laid down by NFC 17-102 Clause 5.2.3.2.

World Isokeraunic Map



## THE PROTECTION

India's first indigenous Lightning Conductor adapted to Indian conditions with French Standards.



## PERFORMANCE TEST REPORTS



$\Delta t$       100kA      Salt Mist      Sulphur Humidification      40kA

## Radii of Protection (m)

Taran provides a wide range of zonal protection and meets the norms of various levels of protection as defined in the Standard NFC 17-102 Clause 5.2.3.2

Taran	Tip Height - h(m)									
	2	3	4	5	6	10	15	20	25	
Level I Protection	32	48	64	79	79	79	80	80	80	
Level II Protection	35	52	69	86	87	88	89	89	90	
Level III Protection	39	58	78	97	97	99	101	102	103	
Level IV Protection	43	64	86	107	107	109	111	113	115	

## Where is Taran useful?

Taran ESE Lightning Protection System is an absolute necessity where both human life and property are together in proximity. A single Taran conductor can protect several blocks. As such, it is highly recommended in:

- **Real Estate Complexes** - High Rise Towers/Buildings/Studio Complexes
- **Community Centres** - Schools/Malls/Education Complexes/Hotels/Hospitals
- **High Security Defense Area** - Air Force Stations/Radars/Hangars/Airports/Infrastructures
- **Government/Public Sectors** - High Courts/Legislative Assemblies/Mints/Offices
- **Telecom/IT Complexes**
- **Power Sector** - Solar Power/Wind - Turbines, Sub Stations - Switch Yards
- **Industrial Plants** - Cement, Steel and Gas Plants, Factory Sheds, Warehouses, Factories having PLC-Based Controls for critical plant and machinery
- **Petroleum/Chemical Plants** - Oxygen Plants, Storage Tank Complexes
- **Public Area** - Hospitals, Cinema Halls, Museums, Heritage Monuments

## Calculation of Taran Protection Radius (NFC 17-102 Clause 5.2.3.2)

$$R_p(h) = \sqrt{2rh - h^2 + \Delta(2r + \Delta)} \quad \text{for } h \geq 5 \text{ m}$$

$$R_p = h \times R_p(5) / 5 \quad \text{for } 2 \text{ m} \leq h \leq 5 \text{ m}$$

where

$R_p(h)$  (m) is the protection radius at a given height  $h$  (m) is the height of the ESEAT tip over the horizontal plane through the furthest point of the object to be protected

- $r$  (m)      20m for protection level I
- 30m for protection level II
- 45m for protection level III
- 60m for protection level IV

$$\Delta(m) \quad \Delta = \Delta T \times 10^6$$

## Taran: Features

- Taran is an ESE type of 'active' lightning conductor that provides zonal protection in accordance with the defined French Standard
  - Taran lightning conductor is a sturdy, robust device of high quality stainless steel. This is highly resistant against impact, corrosion and chemical agents. Ideal in exposed industrial area and climates of high humidity
  - Maintenance - free; easy to install
  - External power source is not required
  - Two-year warranty
- Successfully Passed
- Impulse Current Test of 40kA at CPRI - India
  - Impulse Current Test of 100kA at CITEL - France
  - Humid Sulphurous Atmosphere Test at TUV Rheinland (I) Pvt Ltd - India
  - Salt Mist Test at TUV Rheinland (I) Pvt Ltd - India
  - $\Delta t$  Test at ICMET CRAIOVA - Romania

